

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. - 92. (canceled)

93. (new) A method for controlling microbes selected from the group consisting of protozoa, bacteria, fungi, viruses, and combinations thereof, said method comprising contacting the microbe with a composition comprising crystalline cupric silicate having a silica to copper ratio in the range of 1:0.34 to 1: 5.15.

94. (new) The method of claim 93, wherein the cupric silicate is immobilized.

95. (new) The method of claim 93 wherein the cupric silicate is at least one selected from the group consisting of:

- i) a cupric silicate having a silica to copper ratio of 1: 5.15;
- ii) a cupric silicate having a silica to copper ratio of 1: 0.78;
- iii) a cupric silicate having a silica to copper ratio of 1:0.53; and
- iv) a cupric silicate having a silica to copper ratio of 1:0.34.

96. (new) The method of claim 94 wherein the cupric silicate is at least one selected from the group consisting of:

- i) a cupric silicate having a silica to copper ratio of 1: 5.15;
- ii) a cupric silicate having a silica to copper ratio of 1:0.78;
- iii) a cupric silicate having a silica to copper ratio of 1:0.53; and
- v) a cupric silicate having a silica to copper ratio of 1:0.34.

97. (new) The method of claim 93 wherein

the cupric silicate i) exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 4.3; (b) 2.5; (c) 2.3; (d) 2.0 and (e) 2.0; and an X-ray diffraction pattern having 3 significant peaks at 16.2, 32.2 and 39.7 having peak heights of 2128, 1593 and 1470, respectively;

the cupric silicate ii) exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 2.2 and (b) 2.0; and an X-ray diffraction pattern having 3 significant peaks at 16, 32 and 39 having peak heights of 835, 706 and 502, respectively;

the cupric silicate iii) exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 2.1, (b) 2.0 and (c) 2.1; and an X-ray diffraction pattern having 3 significant peaks at 16.1, 32.2 and 39.71 having peak heights of 400, 394 and 330, respectively; and

the cupric silicate iv) exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 2.1, and (b) 2.0; and an X-ray diffraction pattern having 3 significant peaks at 16.2, 32.3 and 39.8 having peak heights of 541, 414 and 365 respectively.

98. (new) The method of claim 94 wherein

the cupric silicate i) exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 4.3; (b) 2.5; (c) 2.3; (d) 2.0 and (e) 2.0; and an X-ray diffraction pattern having 3 significant peaks at 16.2, 32.2 and 39.7 having peak heights of 2128, 1593 and 1470, respectively;

the cupric silicate ii) exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 2.2 and (b) 2.0; and an X-ray diffraction pattern having 3 significant peaks at 16, 32 and 39 having peak heights of 835, 706 and 502, respectively;

the cupric silicate iii) exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 2.1, (b) 2.0 and (c) 2.1; and an X-ray diffraction pattern having 3 significant peaks at 16.1, 32.2 and 39.71 having of 400, 394 and 330, respectively; and

the cupric silicate (iv) exhibits the following characteristics: characteristic g values of electron spin resonance being (a) 2.1, and (b) 2.0; and an X-ray diffraction pattern having 3 significant peaks at 16.2, 32.3 and 39.8 having peak heights of 541, 414 and 365, respectively.

99. (new) The method of claim 93, wherein the bacteria is selected from the group consisting of coliform bacteria, Gram Positive bacteria, Gram Negative bacteria, or a combination thereof.

100. (new) The method of claim 93, wherein the protozoa is *Cryptosporidium parvum*.

101. (new) The method of claim 93, wherein the fungus is a pathogenic fungus selected from the group consisting of *Sclerotium rolfii*, *Rhizoctonia solani*, *Fusarium oxysporium*, *Pyricularia oryzae*, *Aspergillus sps*, or a combination thereof.

102. (new) A method for controlling microbes selected from the group consisting of protozoa, bacteria, fungi, viruses, and combination thereof, said method comprising contacting the microbe with a composition comprising crystalline cupric silicate having a silica to copper ratio 1:1.

103. (new) The method of claim 102, wherein the cupric silicate is immobilized.

104. (new) The method of claim 102, wherein the cupric silicate exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 3.1; (b) 2.3; (c) 2.0; (d) 1.2 and (e) 0.9; and an X-ray diffraction pattern having significant peaks being (a) 3.1; (b) 2.3; (c) 2.0; (d) 1.2 and (e) 0.9; and an X-ray diffraction pattern having 3 significant peaks at 16.1, 32.2 and 39.7 having peak heights of 940, 764 and 694, respectively.

105. (new) The method of claim 94, wherein the at least one cupric silicate is immobilized on an agropolymer, activated alumina, silica gel, cellulose, or resin-coated quartz sand.

106. (new) The method of claim 102, wherein the at least one cupric silicate is immobilized on an agropolymer, activated alumina, silica gel, cellulose, or resin-coated quartz sand.

107. (new) The method of claim 93, wherein the cupric silicate is produced by a method comprising:

- i) adding a solution of a soluble copper salt to a solution of a soluble alkaline earth silicate to form a mixture, and optionally adding a mineral acid, to obtain a mixture having a pH below 6;
- ii) collecting the precipitate that forms; and
- iii) washing the precipitate to obtain a cupric silicate composition comprising crystalline cupric silicate having a silica to copper ratio in the range of 1:0.34 to 1:5.15.

108. (new) A method for controlling microbes selected from the group consisting of protozoa, bacteria, fungi, viruses, and combinations thereof, said method comprising contacting the microbe with a composition comprising at least one microbiocidal crystalline transition metal silicate selected from the group consisting of: (a) cupric silicate having a silica to copper ratio in the range of 1:0.34 to 1: 5.15; (b) zinc silicate having a silica to zinc ratio in the range of 1:2 to

1:12; (c) silver silicate having a silica having a silica to silver ratio in the range of 1:15 to 1:19.5; (d) manganese silicate having a silica to manganese ratio in the range of 1:1 to 1:1.9; and (e) zirconium silicate having a silica to zirconium ratio in the range of 1:0.77 to 1:2.9.

109. (new) The method of claim 108, wherein the composition comprising at least one crystalline transition metal silicate is immobilized.

110. (new) The method of claim 108, wherein the at least one transition metal silicate is immobilized on an agropolymer, activated alumina, silica gel, cellulose, or resin-coated quartz sand.

111. (new) The method as claimed in claim 108, wherein the microbe is contacted with a composition comprising zinc silicate that has a silica to zinc ratio of 1:12.13 and exhibits the following characteristics: characteristic g values of the electron spin resonance peaks being (a) 5.4; (b) 4.5; (c) 2.5; (d) 2.1 and (e) 2.0; and an X-ray diffraction pattern having 3 significant peaks at 32.7, 59.5 and 26.2 having peak heights of 444, 307 and 263, respectively.

112. (new) The method as claimed in claim 108, wherein the microbe is contacted with a composition comprising zinc silicate that has a silica to zinc ratio of 1:2.46 and exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 4.3; (b) 4.0; (c) 2.5; (d) 1.8 and (e) 2.0; and an X-ray diffraction pattern having 3 significant peaks at 11.0, 33.5 and 32.8 having peak heights of 2079, 835 and 664, respectively.

113. (new) The method as claimed in claim 108, wherein the microbe is contacted with a composition comprising silver silicate that has a silica to silver ratio of 1:19.57 and exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 4.3; (b) 2.3; (c) 3.9 and (d) 2.0; and an X-ray diffraction pattern having 3 significant peaks at 32.2, 46.2 and 27.8 having heights of 3945, 2421 and 1835, respectively.

114. (new) The method as claimed in claim 108, wherein the microbe is contacted with a composition comprising silver silicate that has a silica to silver ratio of 1:1.04 and exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 4.3; (b) 4.0 and (c) 1.9; and an X-ray diffraction pattern having 3 significant peaks at 29.3, 47.6 and 42.3 having peak heights of 2217, 684 and 674, respectively.

115. (new) The method as claimed in claim 108, wherein the microbe is contacted with a composition comprising manganese silicate that has a silica to manganese ratio 1:1.94 and exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 1.93 and (b) 2.06; and an X-ray diffraction pattern having 1 significant peak at 30.0 having peak height of 148.0

116. (new) The method as claimed in 108, wherein the microbe is contacted with a composition comprising manganese silicate that has a silica to manganese ratio of 1:1.09 and exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 4.3; (b) 4.1; (c) 2.1; (d) 2.1; (e) 2.0 and (f) 1.9; and an X-ray diffraction pattern having 1 significant peak at 24.6 having peak height of 32.8.

117. (new) The method as claimed in claim 108, wherein the microbe is contacted with a composition comprising zirconium silicate that has a silica to zirconium ratio of 1:2.9 and exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 4.42; (b) 1.82; (c) 2.24; (d) 2.3; (e) 2.18 and (f) 1.23.

118. (new) The method as claimed in claim 108, wherein the microbe is contacted with a composition comprising zirconium silicate that has a silica to zirconium ratio of 1:0.77 and exhibits the following characteristics: characteristic g values of electron spin resonance peaks being (a) 4.3; (b) 2.8; (c) 1.9; (d) 1.2; (e) 1.0 and (f) 0.9; and an X-ray diffraction pattern having 1 significant peak at 10.8 having peak height of 84.80.